Campanian And Maastrichtian Ammonites From Northern Aquitaine France

Ammonoid PaleobiologyAmmonoid Paleobiology: From anatomy to ecologyAmmonites from the Early Campanian Vaals Formation at the CPL Quarry (Haccourt, Liege, Belgium) and Their Stratigraphic ImplicationsCampanian and Maastrichtian Ammonites from Northern Aquitaine, FranceAmmonoid Paleobiology: From macroevolution to paleogeographyGlobal Catastrophes in Earth History; An Interdisciplinary Conference on Impacts, Volcanism, and Mass MortalitySome Ammonites from the Campanian (Upper Cretaceous) of Northern HokkaidoGeologic Time Scale 2020Upper Cretaceous Ammonites from the Calabar Region, South-east NigeriaThe Mid-Cretaceous Ammonites of the Family Kossmaticeratidae from JapanNotes on Gaudryceratid Ammonites from Hokkaido and SakhalinAn Illustrated Catalogue of Late Cretaceous Fossils from Limburg (The Netherlands) and Adjacent AreasOntogeny of Upper Cretaceous (Turonian-Santonian) Scaphitid Ammonites from the Western Interior of North AmericaAphlebia Princeps Nov. Sp., from the Westphalian A/B of the Former Oranje Nassau III Coal Mine at Hoensbroek (Province of Limburg, the Netherlands)Abhandlungen der Geologischen BundesanstaltMaastrichtian Ammonites from the Biscay Region (France, Spain)Cephalopods from the Cretaceous/Tertiary Boundary Interval on the Atlantic Coastal Plain, with a Description of the Highest Ammonite Zones in North AmericaGeological QuarterlyTransactions and Proceedings of the Palaeontological Society of JapanMaastrichtian Ammonites from the Biscay Region (France, Spain) Neil H. Landman Christian Klug John W. M. Jagt William James Kennedy Christian Klug Virgil L. Sharpton Tatsurō Matsumoto Felix Gradstein P. M. P. Zaborski Tatsurō Matsumoto Tatsurō Matsumoto John W. M. Jagt Neil H. Landman H. W. J. van Amerom Geologische Bundesanstalt (Austria) Peter D. Ward Neil H. Landman Nihon Koseibutsu Gakkai Peter Douglas Ward

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renowned researchers summarize the current knowledge on ammonoid paleobiology the book begins with a description of the systematic position of the ammonoidea within the cephalopoda providing the phylogenetic framework for the rest of the book following discussions include soft and hard part morphology of ammonoids rate of growth and ontogeny and taphonomy and ecology closing chapters explore the distribution of ammonoids in time and space as well as their extinction at the end of the cretaceous with its diverse viewpoints and new material this resource will benefit researchers and graduate students in paleontology marine biology and evolutionary biology

this two volume work is a testament to the abiding interest and human fascination with ammonites we offer a new model to explain the morphogenesis of septa and the shell we explore their habitats by the content of stable isotopes in their shells we discuss the origin and

later evolution of this important clade and we deliver hypotheses on its demise the ammonoidea produced a great number of species that can be used in biostratigraphy and possibly this is the macrofossil group which has been used the most for that purpose nevertheless many aspects of their anatomy mode of life development or paleobiogeographic distribution are still poorly known themes treated are biostratigraphy paleoecology paleoenvironment paleobiogeography evolution phylogeny and ontogeny advances such as an explosion of new information about ammonites new technologies such as isotopic analysis tomography and virtual paleontology in general as well as continuous discovery of new fossil finds have given us the opportunity to present a comprehensive and timely state of the art compilation moreover it also points the way for future studies to further enhance our understanding of this endlessly fascinating group of organisms

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the conference was held in snowbird utah october 1988 as a sequel to the conference on large body impacts held in 1981 also in snowbird this volume contains 58 peer reviewed papers arranged into sections that cover the major themes of the conference catastrophic impacts volcanism and mass mortality geological signatures of impacts environmental effects of impacts patterns of mass mortality volcanism and its effects case histories of mass mortalities and

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geologic time scale 2020 2 volume set contains contributions from 80 leading scientists who present syntheses in an easy to understand format that includes numerous color charts maps and photographs in addition to detailed overviews of chronostratigraphy evolution geochemistry sequence stratigraphy and planetary geology the gts2020 volumes have separate chapters on each geologic period with compilations of the history of divisions the current gssps global boundary stratotypes detailed bio geochem sequence correlation charts and derivation of the age models the authors are on the forefront of chronostratigraphic research and initiatives surrounding the creation of an international geologic time scale the included charts display the most up to date international standard as ratified by the international commission on stratigraphy and the international union of geological sciences as the framework for deciphering the history of our planet earth this book is essential for practicing earth scientists and academics completely updated geologic time scale provides the most detailed integrated geologic time scale available that compiles and synthesize information in one reference gives insights on the construction strengths and limitations of the geological time scale that greatly enhances its function and its utility

scaphites are a group of late cretaceous heteromorphic ammonites in which the final body chamber partially uncoils thereby marking the attainment of the adult stage this distinctive change in shape permits unequivocal separation of variation due to developmental stage from phenotypic variation among adults in the western interior of north america scaphites are represented by a wide diversity of endemic species many of these species are abundant and well preserved and therefore are especially suitable for a detailed investigation of ontogenetic development i studied the ontogeny of several species of turonian santonian scaphites in the genera scaphites clioscaphites and pteroscaphites utilizing both whole fossils and polished sections the study of their ontogeny bears on the questions of scaphite systematics and morphological development and ammonite life history in general the initial whorls of scaphites as in other ammonites consist of a bulbous protoconch and part of a planispiral whorl referred to as the ammonitella the ammonitella displays a uniform tuberculate micro ornamentation extending 0 75 whorls to a depression primary constriction after which growth lines appear the shell wall is prismatic in microstructure and nacre first appears at the constriction where it

forms an internal pad primary varix these morphological observations support a scheme of direct development in which the constriction marks the aperture of the embryonic shell preserved ammonitellas of scaphites ferronensis and baculites cf b asper b codyensis suggest that hatching may have occurred after the development of the proseptum in scaphites the proseptum displays a unique necklike attachment that appears as a superimposed saddle on the prosuture the caecum and its prosiphonal attachment are similar among all the species studied the diameter of the embryonic shell averages 700 micrometers and ranges from approximately 600 to 800 micrometers the ammonitella angle averages 270ð which is similar to the angular length of the juvenile body chamber unlike modern nautilus the embryonic shell is comparable in size to the young of many recent dibranchiate cephalopods and may have followed a planktonic mode of life immediately after hatching the juvenile shell conforms to a logarithmic spiral but exhibits a conspicuous change in morphology at approximately 3 4 mm diameter corresponding to two whorls from the primary constriction the change involves modifications in the growth patterns of the umbilical diameter and spiral radius and coincides with the first appearance of macro ornamentation it also corresponds to a minimum in septal spacing and the attainment of a stable ventral position of the siphuncle these changes may indicate a transition from a passive planktonic to a more active mode of life similar morphometric changes occur in many other ammonites at this approximate size and whorl number and may represent a common developmental pattern in micromorph scaphites of the genus pteroscaphites this whorl size coincides with the initiation of an accelerated maturity as in modern nautilus the period of septal secretion in scaphites and other ammonites was probably dependent on the rate of apertural growth and buoyancy requirements rather than external astronomical rhythms the period may also have displayed an increase over ontogeny although the absolute rate of growth is unknown maturity is expressed by the development of an uncoiled body chamber although the degree of uncoiling varies widely among species interspecific comparisons are therefore facilitated by examination of the more similarly shaped phragmocones within species histograms of adult phragmocone diameter form unimodal distributions although a well marked sexual dimorphism appears in many species the ratio of maximum to minimum phragmocone diameter ranges from 1 7 in s preventricosus to 4 6 in s carlilensis the diameter of the adult phragmocone and the number of postembryonic whorls exhibit a positive correlation within and among species the adult size and the extent to which the mature body chamber uncoils also covary within and among species evolutionary changes in size with concomitant changes in the timing of sexual

maturation may thus explain interspecific variation in the degree of mature uncoiling page 119

geological investigations in the upper manasquan river basin central monmouth county new jersey reveal a cretaceous tertiary cretaceous paleogene succession consisting of approximately 2 m of the tinton formation overlain by 2 m of the hornerstown formation the top of the tinton formation consists of a very fossiliferous unit approximately 20 cm thick which we refer to as the pinna layer it is laterally extensive and consists mostly of glauconitic minerals and some angular quartz grains the pinna layer is truncated at the top and is overlain by the hornerstown formation which consists of nearly equal amounts of glauconitic minerals and siderite the base of the hornerstown formation is marked by a concentration of siderite nodules containing reworked fossils this layer also contains a few fossils of organisms that were living in the environment during the time of reworking at some downdip sites there is an additional layer the burrowed unit which is sandwiched between the top of the pinna layer and the concentrated bed of nodules this unit is very thin and is characterized by large burrows piping down material from above the pinna layer is abundantly fossiliferous and represents a diverse nearshore marine community it contains approximately 110 species of bivalves gastropods cephalopods echinoids sponges annelids bryozoans crustaceans and dinoflagellates the cephalopods include eutrephoceras dekayi morton 1834 pachydiscus neodesmoceras mokotibensis collignon 1952 sphenodiscus lobatus tuomey 1856 eubaculites carinatus morton 1834 eubaculites latecarinatus brunnschweiler 1966 discoscaphites iris conrad 1858 discoscaphites sphaeroidalis kennedy and cobban 2000 discoscaphites minardi landman et al 2004b discoscaphites gulosus morton 1834 and discoscaphites jerseyensis n sp the dinoflagellates include palynodinium grallator gocht 1970 thalassiphora pelagica eisenack 1954 eisenack gocht 1960 deflandrea galeata lejeune carpentier 1942 lentin williams 1973 and disphaerogena carposphaeropsis wetzel 1933 these ammonites and dinoflagellates are indicative of the uppermost maastrichtian corresponding to the upper part of calcareous nannofossil subzone cc26b the mode of occurrence of the fossils in the pinna layer suggests an autochthonous accumulation with little or no postmortem transport many of the benthic organisms are preserved in life position for example specimens of pinna laqueata conrad 1858 are oriented in a vertical position similar to that of modern members of this genus the echinoids also occur in aggregations of hundreds of individuals suggesting gregarious feeding behavior in addition there are monospecific clusters of baculites and scaphites these clusters

are biological in origin and could not have been produced by hydraulic means scaphite jaws are also present representing the first reports of these structures in the upper cretaceous of the atlantic coastal plain they occur both as isolated specimens and inside the body chamber and indicate little or no postmortem transport the pinna layer represents a geologically short interval of time the fact that most of the animals are mature suggests that the community persisted for at least 5 10 years if multiple generations of animals are present perhaps reflecting multiple episodes of colonization and burial then this unit probably represents more time amounting to several tens of years the fact that the pinna layer is truncated at the top implies a still longer period of time amounting to hundreds of years these age estimates are consistent with observed rates of sedimentation in nearshore environments iridium analyses of 37 samples of sediment from three sites in the manasquan river basin reveal an elevated concentration of iridium of 520 pg g on average at the base of the pinna layer the iridium profile is aymmetric with an abrupt drop off above the base of this unit and a gradual decline below the base the elevated concentration of iridium is not as high as that recorded from some other cretaceous tertiary boundary sections however it is sufficiently above background level to suggest that it is related to the global ir anomaly documented at many other localities and attributed to a bolide impact the position of the iridium anomaly at the base of the pinna layer is inconsistent with the biostratigraphic data because this anomaly occurs below the unit containing fossils indicative of the uppermost maastrichtian we present two alternative hypotheses 1 if the enriched concentration of iridium is in place it marks the cretaceous tertiary boundary by reference to the global stratotype section and point at el kef tunisia the position of the iridium anomaly further implies that the pinna community was living at the moment of impact and may even have flourished in its immediate wake subsequently the community may have been buried by pulses of mud rich sediment possibly associated with enhanced riverine discharge following the impact the burrowed unit may represent a subsequent pulse of riverine discharge that scoured the top of the pinna layer 2 the iridium anomaly was originally located at the top of the pinna layer and was displaced downward due to bioturbation and or chemical diffusion this hypothesis implies that the pinna layer was deposited prior to the deposition of the iridium the pinna community may have died before or at the moment of impact erosion of the top of the pinna layer and deposition of the burrowed unit may have been associated with events immediately following the impact in both hypotheses the sea floor experienced an extended period of erosion and reworking in the early danian which may have lasted for several

hundred thousand years producing a concentrated lag of siderite nodules containing reworked fossils in the basal part of the hornerstown formation this lag deposit is equivalent to the main fossiliferous layer at the base of the hornerstown formation elsewhere in new jersey this period of erosion and reworking was probably associated with a transgression in the early danian the post impact community was greatly reduced in diversity with most of the species representing cretaceous survivors

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